REMARKS

Claims 1 and 3-20 are pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks herein.

Claim Rejections – 35 USC § 102

Claims 1, 3-15, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 6,005,538 to Hoekstra ("Hoekstra"). This rejection is respectfully traversed.

When applying a reference under 35 U.S.C. §102, a "claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). More specifically, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). As discussed in further detail below, Hoekstra fails to describe each and every element as set forth in either claim 1 or claim 12, and further fails to show the identical invention in as complete detail as is contained in either claim 1 or claim 12.

Claim 1 in view of Hoekstra

As amended herein, claim 1 includes the features of the controlling unit keeping the filament from being heated with the output of the filament driving unit all through an ON period when the ON period is shorter than a predetermined time period, and enabling the filament to be heated when the ON period is not shorter than the predetermined time period. Claim 1 also provides that the ON period is a time period, during which a voltage able to drive the grid electrode and the segment electrode is applied to both of the grid electrode and the segment electrode. Hoekstra fails to disclose such features.

Hoekstra is directed to a vacuum fluorescent display driver that drives a vacuum fluorescent display from a unipolar source without the necessity for a separate display driver integrated circuit (see col. 2, lines 24-29). More specifically, Hoekstra provides a display driver 40 having a segment select circuit 42 that includes output lines 44, which are connected with

segments 20a-20g of a display 12. The display driver 40 further includes a digit ON/OFF control 46 that selectively applies a voltage to a grid 24 and a filament supply circuit 49 for supplying power to a filament 26 (see Fig. 3, and col. 3, lines 40-46). The filament supply circuit 49 selectively heats the filament 26, and provides a negative voltage to the filament 26 in order to provide a sufficient voltage differential to illuminate selected segments 20a-20g of the display 12 (see col. 3, lines 50-58).

With particular reference to Fig. 8 of Hoekstra, the relationship between the heating of filament 26 and the application of the negative voltage to the filament 26 can be seen. Fig. 8 is a trace of the voltage that is applied to the filament 26. During the interval A, the filament 26 is heated. At the end of interval A and the beginning of interval B, the supply of current to the filament 26 is discontinued, and a low current voltage is applied to the filament 26 (see col. 4, lines 33-44). In this manner, a negative voltage is developed without the necessity of a bipolar power supply, which is the objective of Hoekstra. More specifically, this is achieved by utilizing the energy stored during the interval A, when the filament 26 is heated (see col. 4, lines 52-56).

The Examiner argues that Hoekstra discloses a period during which electrical potential of a particular polarity is applied to a segment and a grid in order to illuminate the segment and the grid, citing col. 2, lines 35-48, and argues that this period corresponds to the ON period of claim. The Examiner further argues that a microcomputer 92, shown in Fig. 5 of Hoekstra, disables the filament to be heated during the interval B.

As discussed in detail above, the filament 26 of Hoekstra is heated during interval A, and a negative voltage is applied to the filament 26 during interval B, while the segments 20a-20g of the display 12 are lit. The intervals A and B, however, are repeated without any condition, and there is no relationship between the drive of the filament, and the drive of the segment and the grid. On the other hand, and in accordance with claim 1, the filament is not heated during the ON period, when the ON period is shorter than a predetermined time period, and the filament is able to be heated when the ON period is not shorter than the predetermined time period. Accordingly, claim 1 provides for the filament to be heated during the ON period, based on a condition (i.e., the ON period being longer than the predetermined time period).

There is no disclosure in Hoekstra regarding the feature of conditionally enabling the filament to be heated during the ON period. In fact, such a feature would contradict the express

teaching of Hoekstra. As noted above, Hoekstra requires the energy stored in the filament to be used during the ON period, in order to avoid the need for a bipolar power supply. Consequently, Hoekstra could not provide for heating of the filament (i.e., applying energy to the filament) during the ON period.

In view of the foregoing, Hoekstra fails to describe each and every element as set forth in claim 1, and further fails to show the identical invention in as complete detail as is contained in claim 1. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

Claim 12 in view of Hoekstra

As amended herein, claim 12 provides the features of enabling or disabling the filament to be heated with an output of the filament driving unit, and setting a pulse width and/or a pulse cycle of a pulse driving signal for pulse-driving the filament based on data received from exterior, when enabling the filament to be heated. Hoekstra fails to disclose such features.

In addition to the features described above, Hoekstra further includes the microcomputer 92, which selectively illuminates the segments 20a-20g of the display 12. More specifically, the microcomputer 92 provides a positive potential when a corresponding segment is to be illuminated, and a negative potential in order to darken a corresponding segment (see col. 5, lines 62-65). As discussed above, the filament 26 stores energy during the heating interval A, which stored energy is subsequently used by the microcomputer 92 to darken select segments. More specifically, at the end of interval A and the beginning of interval B, a transistor Q1 opens, and the energy stored in an inductor L1 (see Fig. 5) causes a current to flow through a diode D1. This charges a capacitor C1 in a manner which produces a negative potential on the $-V_{KK}$ line 98. The negative potential on line 98 is provided as an input to microcomputer 92, which uses the negative potential to darken the selected segments (see col. 6, lines 31-44).

The Examiner argues that the microcomputer 92 of Hoekstra corresponds to the controlling unit of claim 12, and that $-V_{KK}$ on line 98 of Hoekstra corresponds to the data received from exterior of the present invention. As discussed above, $-V_{KK}$ on line 98 is a negative potential that is provided as an input to the microcomputer when heating of the filament 26 ends, and a transistor Q1 that drives the filament changes from ON to OFF. Again, the microcomputer 92 utilizes the negative potential as a potential for making the grid or the segment OFF (see col. 6, lines 38-44). Consequently, the microcomputer 92 does not set a pulse

width or a pulse cycle of a pulse-driving signal for the filament based on $-V_{KK}$, and therefore differs from the controlling unit as described in claim 12. In other words, in Hoekstra, neither a pulse width nor a pulse cycle is set based on $-V_{KK}$.

Furthermore, the Examiner argues that "the pulse width or the pulse cycle of the pulse-driving signal is recited in claim 12, but this is commonly known as an ON/OFF period with variation of duty cycle, and therefore there is no distinct feature in claim 12". Claim 12, however, provides the feature of setting a pulse width and/or a pulse cycle of a pulse driving signal for pulse-driving the filament based on the data. It is respectfully noted that there is no such disclosure in Hoekstra.

In view of the foregoing, Hoekstra fails to describe each and every element as set forth in claim 12, and further fails to show the identical invention in as complete detail as is contained in claim 12. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

Claims 3-11, 13-15, and 17-20 in view of Hoekstra

Each of claims 3-11, 13-15, and 17-20 ultimately depends from one of claims 1 and 12, which define over the prior art, as discussed in detail above. Accordingly, each of claims 3-11, 13-15, and 17-20 also defines over the prior art for at least the same reasons, and reconsideration and withdrawal of the rejections are respectfully requested.

Claim Rejections – 35 USC § 103

Claim 16 is rejected under 35 U.S.C. 103(a) as being obvious over Hoekstra in view of U.S. Pat. No. 4,968,917 to Harris ("Harris"). This rejection is respectfully traversed.

It is initially noted that claim 16 ultimately depends from claim 12, which defines over the prior art, as discussed in detail above. Accordingly, claim 16 also defines over the prior art for at least the same reasons, and reconsideration and withdrawal of the rejection are respectfully requested.

Furthermore, the Examiner argues that a dual comparator 35 shown in Fig. 1 of Harris is used for determining whether DIM Select is between LR1 and LR2, and that the dual comparator 35 is associated with timing t shown in Fig. 2 of Harris. Applicants respectfully note that the output of the dual comparator 35 turns to H-level, when DIM Select is between LR1 and LR2. If the output of the dual comparator 35 turns to H-level, a pulse width of a pulse output from a

display driver 60 is changed. That is, the dual comparator 35 controls a timing of changing the pulse width of the pulse output from the display driver 60 from one pulse width to another pulse width.

On the other hand, and in accordance with claim 16, the first comparing unit and the second comparing unit control a timing of changing a logical level of the pulse for driving the filament based on the data received from exterior. Namely, the timing to be controlled in accordance with claim 16 is completely different from that in Harris. Therefore, Harris does not disclose control of the timing of changing the logical level of the pulse based on the data received from exterior. In fact, it is impossible in accordance with the teachings of Harris to achieve the effect that the pulse width or the pulse cycle is able to be set based on the data received from exterior using the dual comparator 35. Consequently, the combination of Hoekstra and Harris still fails to disclose the features of claim 16, and reconsideration and withdrawal of the rejection are respectfully requested.

CONCLUSION

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reason for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to amendment.

No charges are believed due. However, if any fees are due, they are being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050 referencing Attorney Docket No. 16359-005001.

Respectfully submitted,

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